GEANT4 Simulation of Neutrons in LUXE ECal

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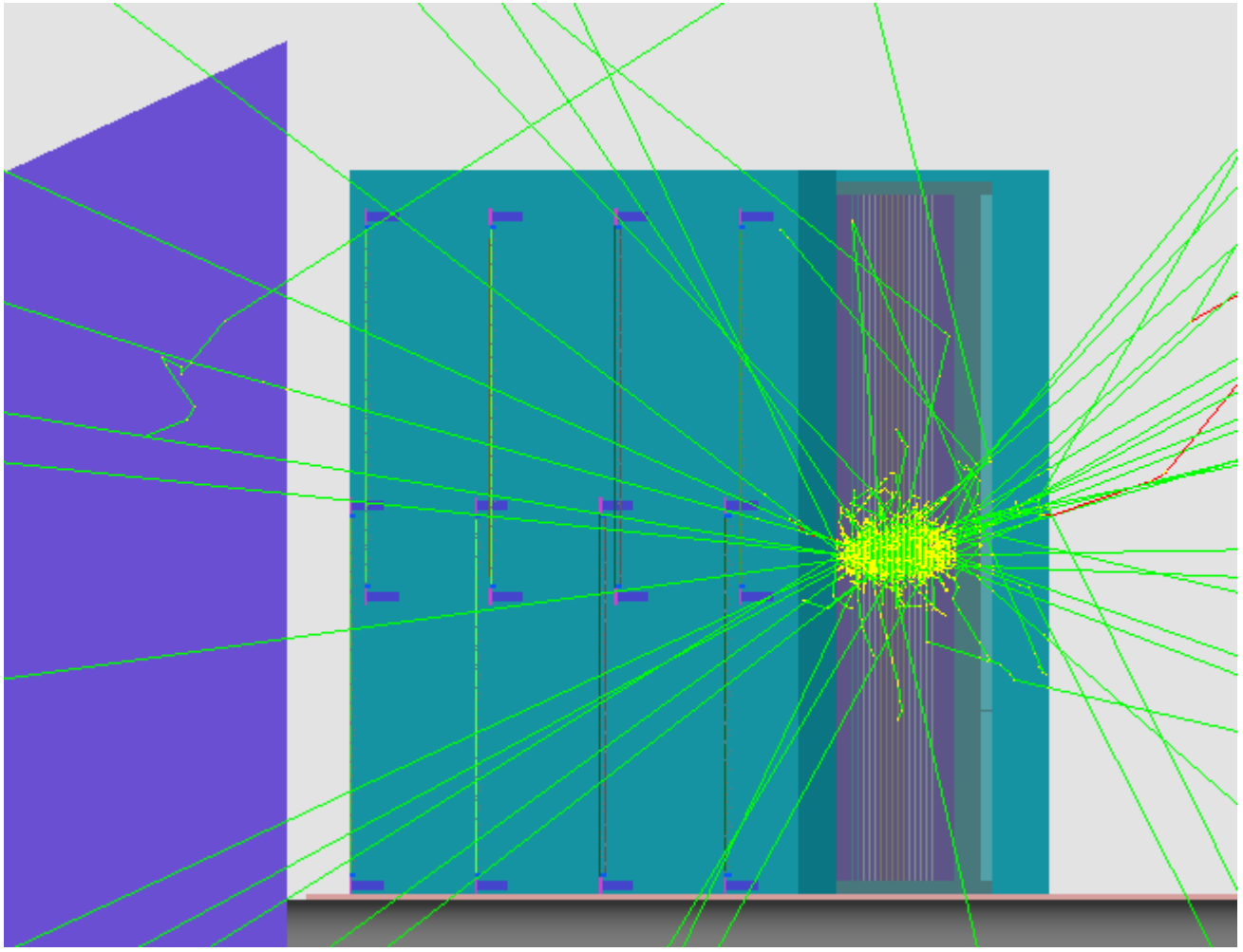
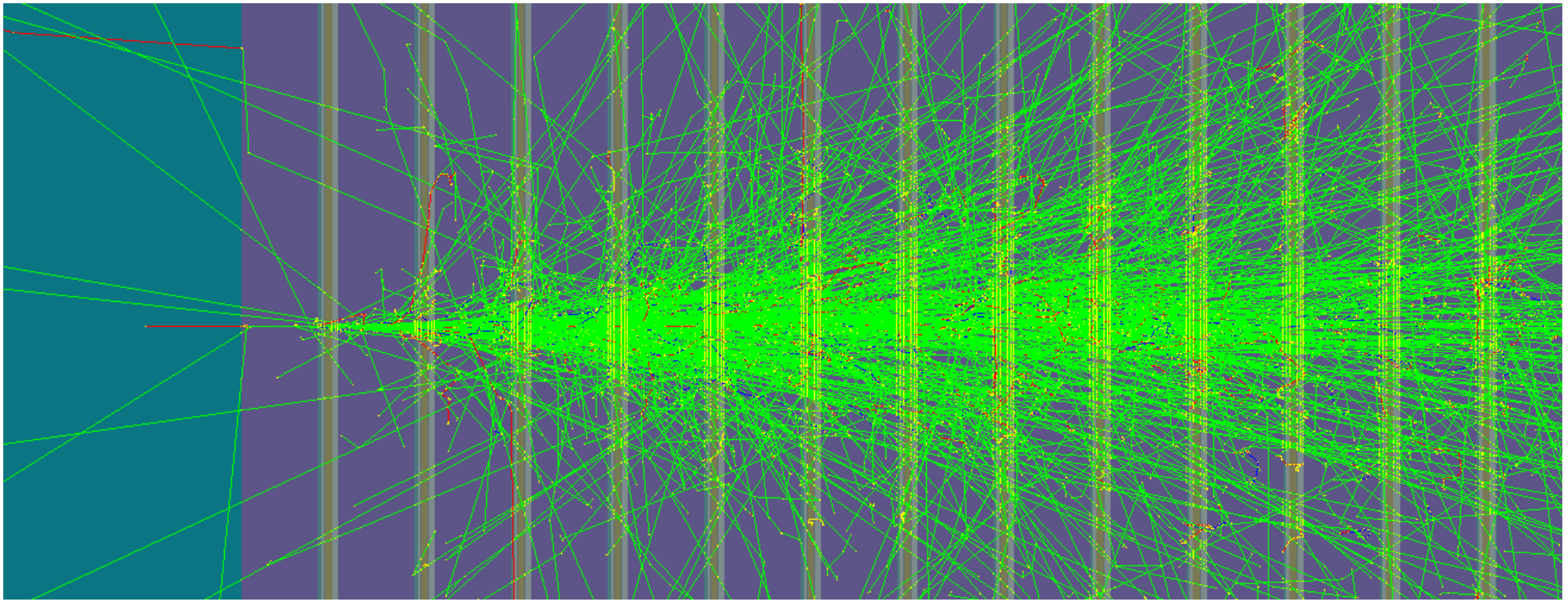
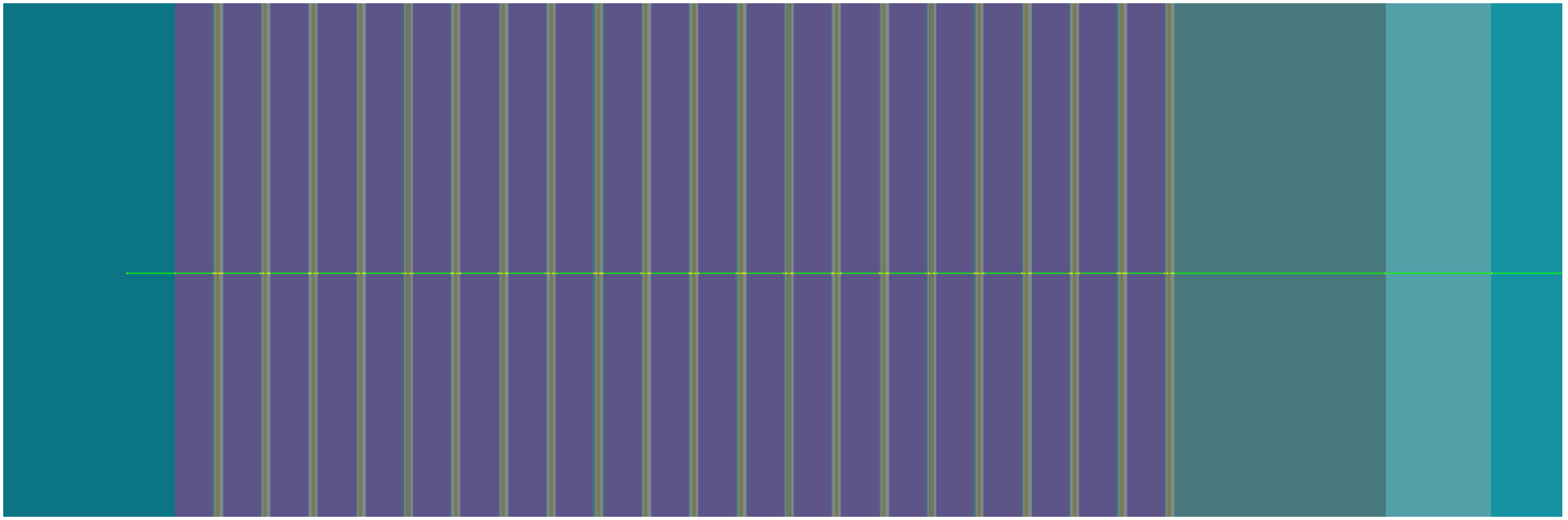
Single electron in ECal



Single electron in ECal

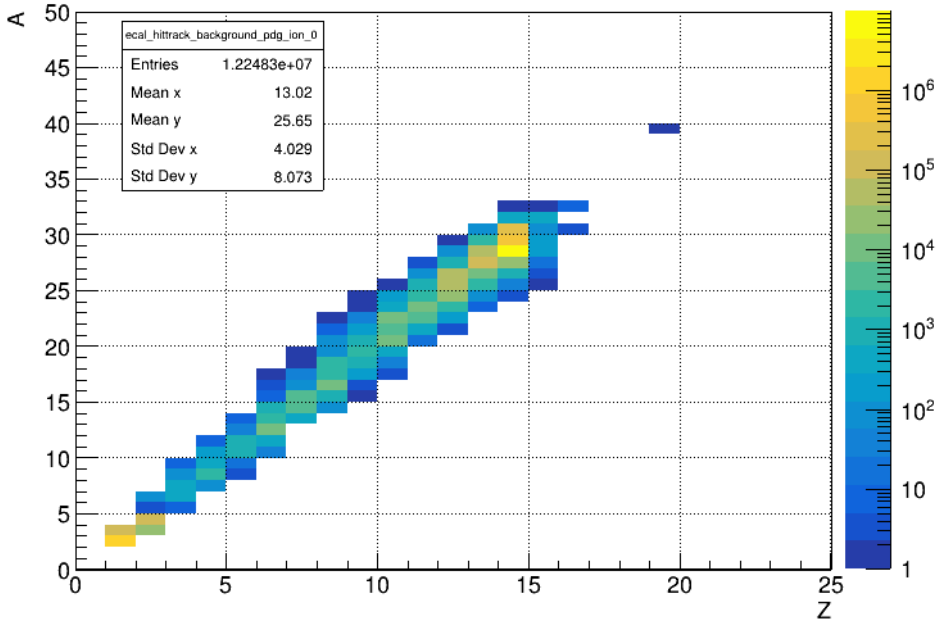


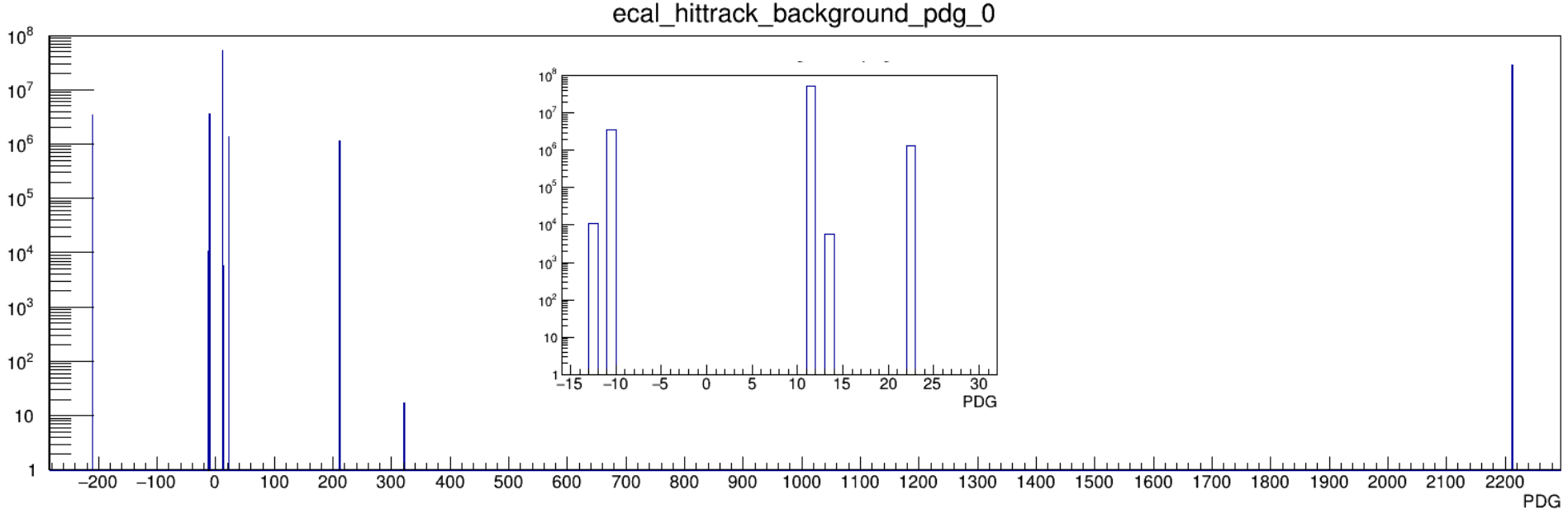
Single neutron in ECal



Particles contributed in energy deposition in ECal silicon sensors

9.95e7 neutrons of 1 GeV

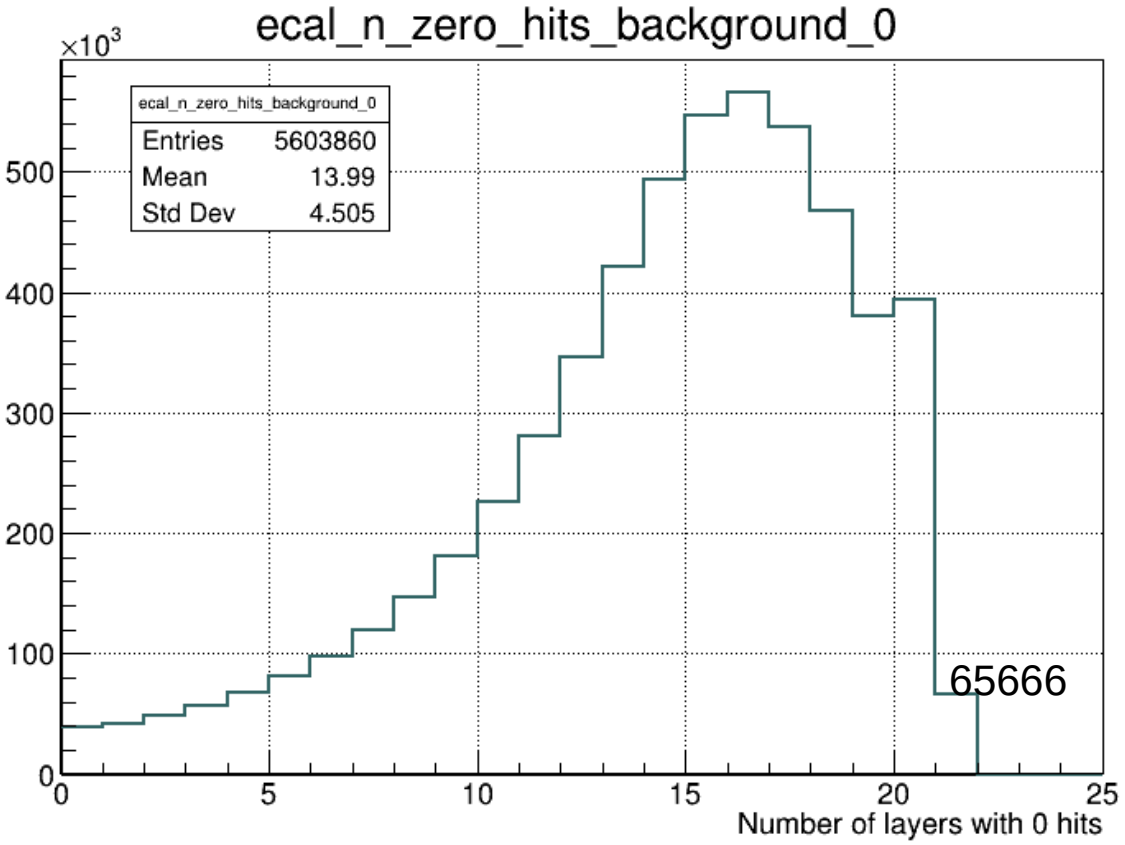


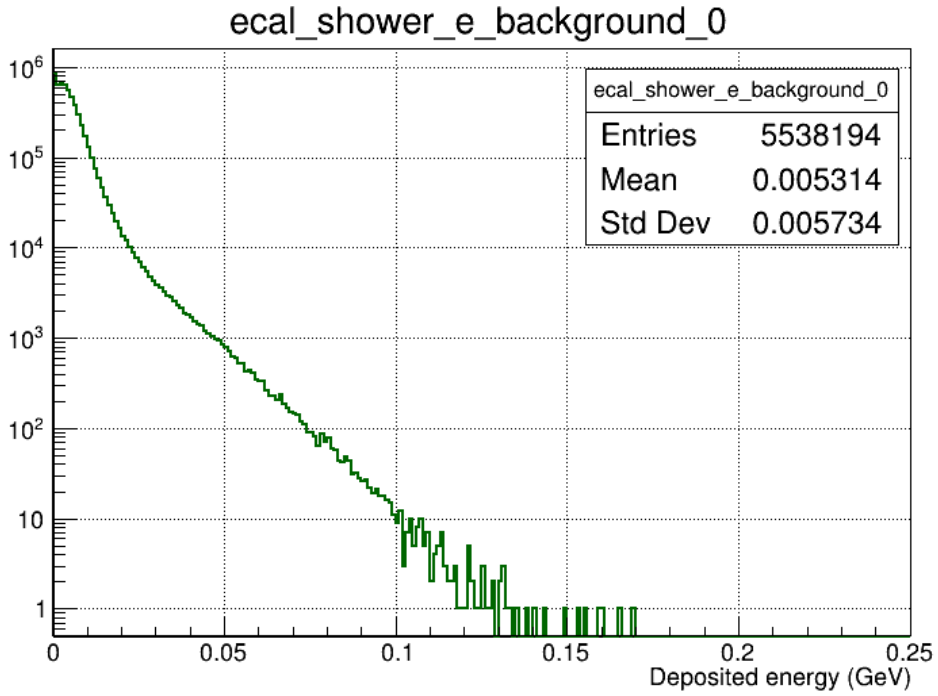


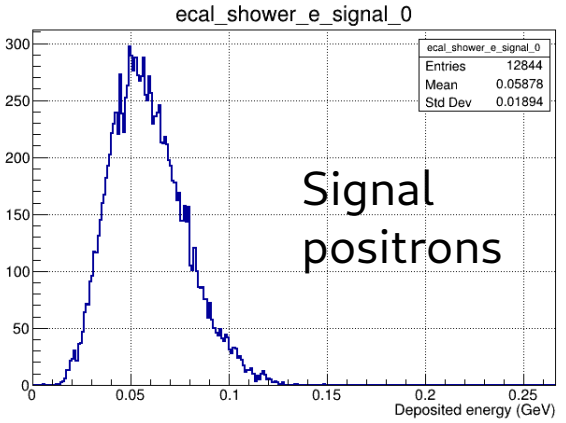
Energy deposition

Fraction of neutrons producing hits in ECal

(5603860 – 65666)/9.95e6 = 0.5566



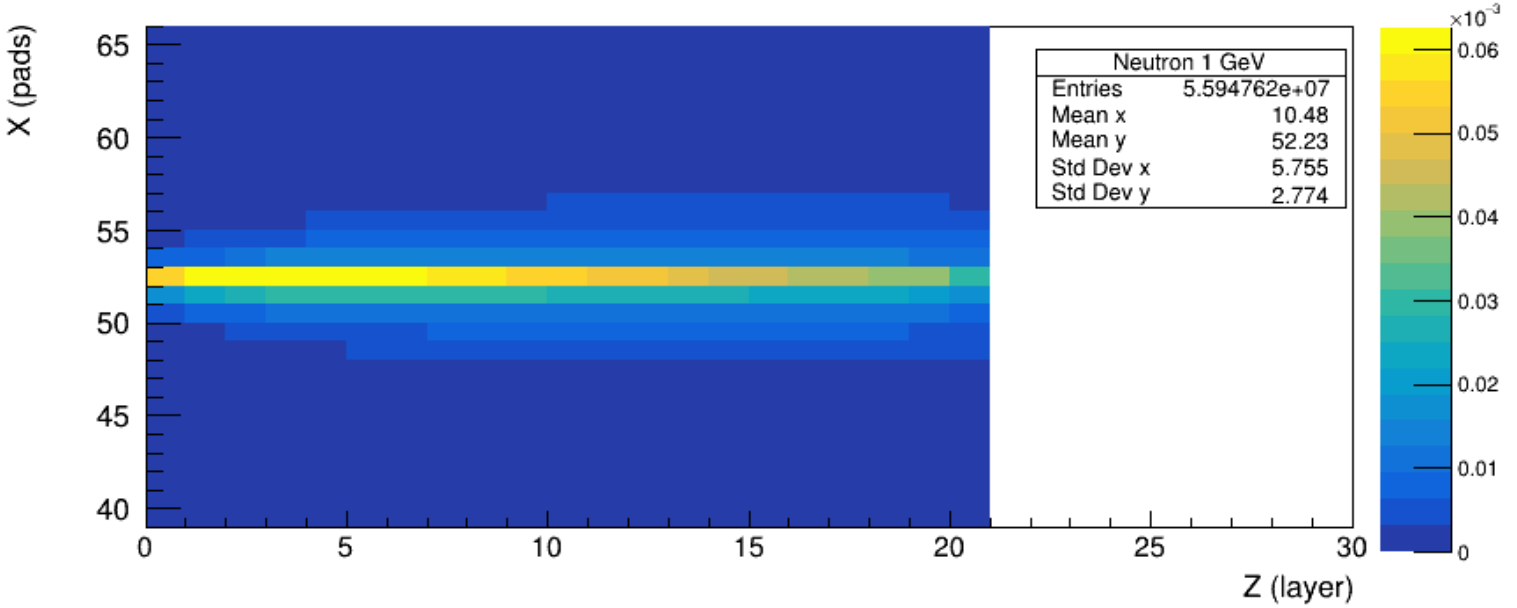




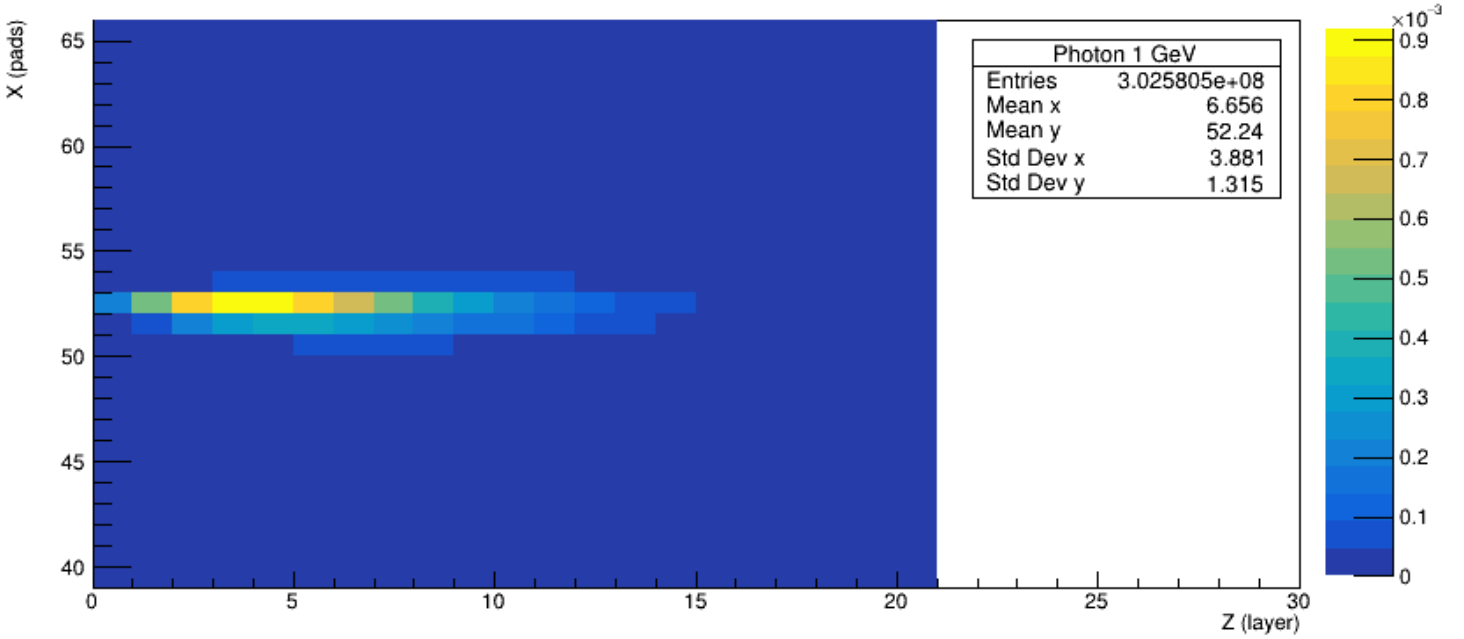
Neutron and photon shower in ECal

Average deposited energy per incident particle

n 1 GeV;



y 1 GeV;

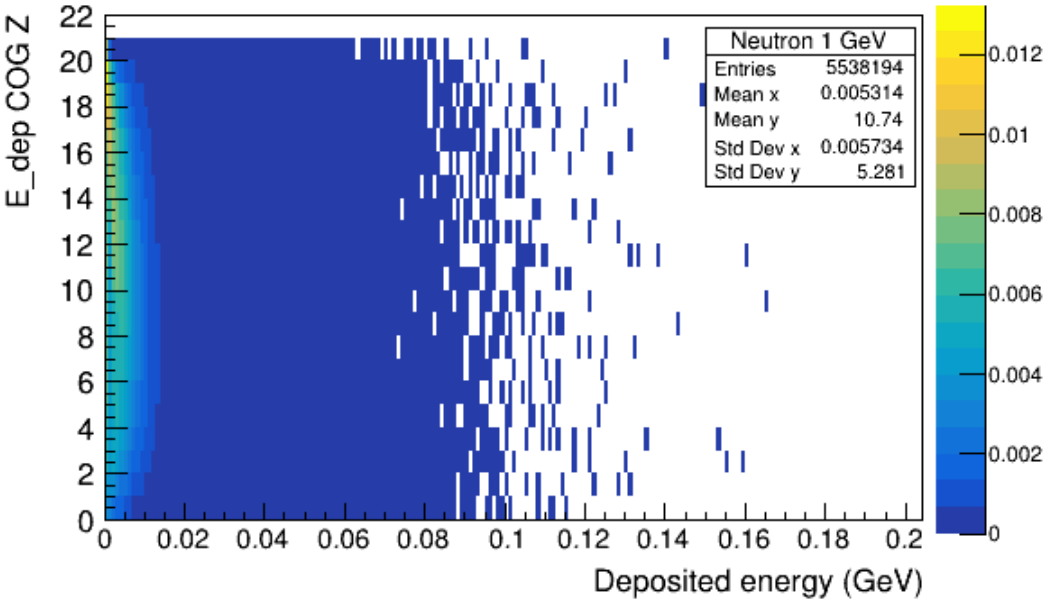


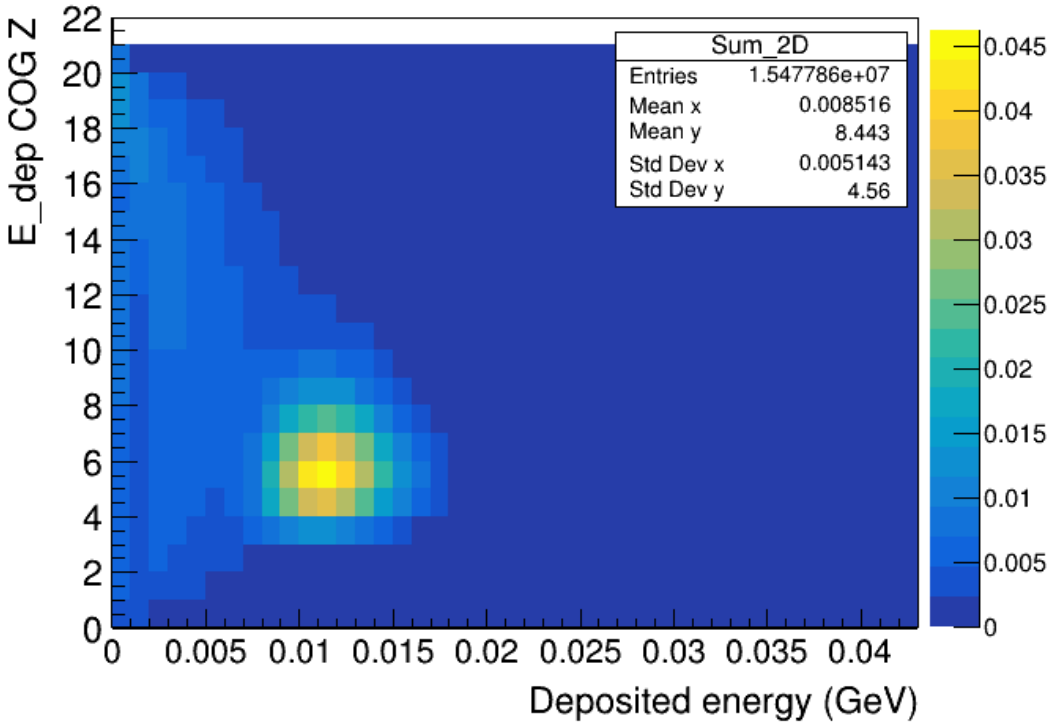
Neutron and photon energy deposition

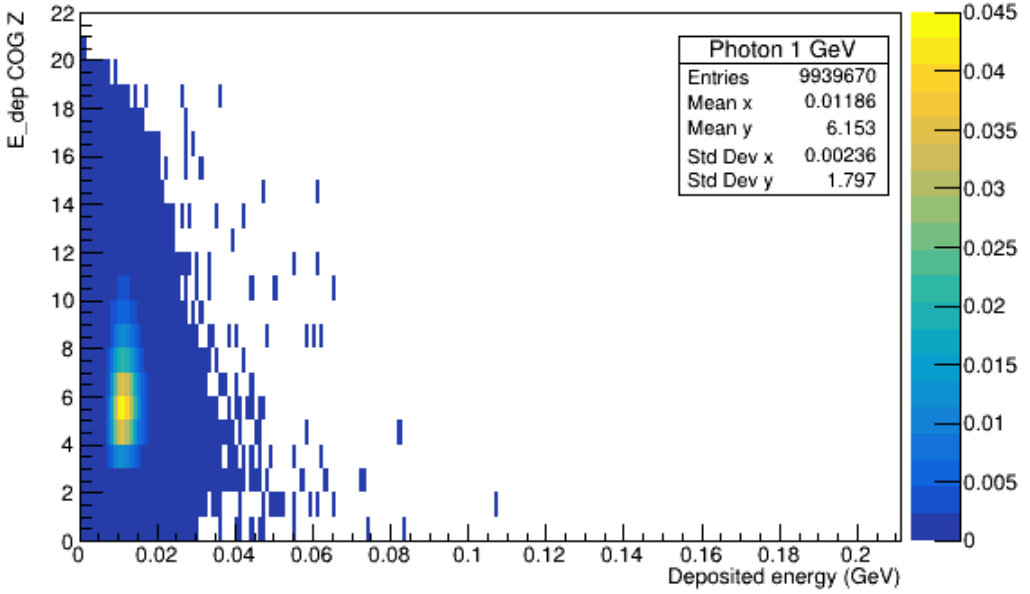
n 1 GeV;
γ 1 GeV;

- Center of gravity of the shower longitudinal direction
- COG weighted with deposited energy in the layer

$$Z = \sum_{Layers} w_i Z_i \qquad w_i = \frac{E_i}{E_{tot}}$$







Neutron and photon energy deposition

n 1 GeV;
y 1 GeV;

- Center of gravity of the shower longitudinal direction
- COG weighted with number of active pads in the layer

$$Z = \sum_{Layers} w_i Z_i \qquad w_i = \frac{N_i}{N_{tot}}$$